

WHAT IS CLAIMED IS:

1. Scroll pumping apparatus comprising:
a first scroll element and a second scroll element;
- 5 a drive mechanism operatively coupled to said second scroll element for producing orbiting motion of said second scroll element relative to said first scroll element; and
a synchronization device, comprising a strip having connected, substantially flat sections coupled between said first scroll element and said second scroll element.
- 10 2. Scroll pumping apparatus as defined in claim 1, wherein the synchronization device has a generally square configuration.
3. Scroll pumping apparatus as defined in claim 2, wherein the substantially flat sections of the synchronization device are joined by connecting sections.
- 15 4. Scroll pumping apparatus as defined in claim 3, wherein the connecting sections have a radius.
5. Scroll pumping apparatus as defined in claim 4, wherein a ratio of the radius of the connecting sections to a side dimension of the square configuration is about 0.25 or less, and
20 preferably is about 0.1 or less.
6. Scroll pumping apparatus as defined in claim 3, wherein the connecting sections are substantially flat.
- 25 7. Scroll pumping apparatus as defined in claim 1, wherein said strip includes two or more layers.
8. Scroll pumping apparatus as defined in claim 1, wherein the synchronization device
30 comprises a generally square configuration having first and second substantially flat sections on opposite sides of the square configuration, wherein the first and second substantially flat sections are coupled to the second scroll element; and
third and fourth substantially flat sections on opposite sides of the square configuration, wherein the third and fourth substantially flat sections are coupled to the first scroll element.

9. Scroll pumping apparatus as defined in claim 1, wherein the first scroll element comprises a stationary scroll element and the second scroll element comprises an orbiting scroll element.

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10. Scroll pumping apparatus as defined in claim 1, configured as a vacuum pump or as a compressor.

11. Scroll pumping apparatus comprising:

10 a scroll set having an inlet and an outlet, said scroll set comprising a stationary scroll element including a stationary scroll blade and an orbiting scroll element including an orbiting scroll blade, wherein said stationary and orbiting scroll blades are intermeshed together to define one or more interblade pockets;

15 a drive mechanism operatively coupled to said orbiting scroll element for producing orbiting motion of said orbiting scroll blade relative to said stationary scroll blade so as to cause said one or more interblade pockets to move toward said outlet; and

a synchronization device, comprising a strip having connected, substantially flat sections, coupled between said orbiting scroll element and a stationary component of said scroll pumping apparatus.

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12. Scroll pumping apparatus as defined in claim 11, wherein the synchronization device has a generally square configuration;

the substantially flat sections of the synchronization device are joined by connecting sections; and

25 the connecting sections have a radius.

13. Scroll pumping apparatus as defined in claim 11, wherein said strip includes areas for connection to the orbiting scroll element and areas for connection to the stationary component of said scroll pumping apparatus.

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14. Scroll pumping apparatus as defined in claim 11, wherein ends of the strip overlap to form one side of a generally square configuration.

15. Scroll pumping apparatus as defined in claim 11, wherein the synchronization device has a closed loop configuration.

16. Scroll pumping apparatus as defined in claim 11, wherein one or more of the
5 substantially flat sections include reinforcing portions.

17. A method for operating scroll pumping apparatus of the type comprising a first scroll element and a second scroll element, the method comprising:

10 producing orbiting motion of said second scroll element relative to said first scroll element; and

synchronizing the first scroll element and the second scroll element during the orbiting motion with a synchronization device, comprising a strip having connected, substantially flat sections, coupled between said first scroll element and said second scroll element.

15 18. The method as defined in claim 17, wherein the synchronization device comprises a generally square configuration having first and second substantially flat sections on opposite sides of the square configuration, further comprising coupling the first and second substantially flat sections to the second scroll element.

20 19. The method as defined in claim 18, wherein the synchronization device further comprises third and fourth substantially flat sections on opposite sides of the square configuration, further comprising coupling the third and fourth substantially flat sections to the first scroll element.

25 20. The method as defined in claim 17, further comprising limiting axial movement of said second scroll element relative to said first scroll element with the synchronization device.